

REMARKS:

Claims 1 –11, 15 and 16 are pending and stand rejected.

Claim 1 has been amended to include the limitations of claim 3, and claim 3 has been cancelled without prejudice. Since this combination has already been searched and examined, no new search is required by this amendment.

It is believed that no new matter has been added by the amendments.

35 U.S.C. §112

A. Claims 1-11, 15, and 16 stand rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. Specifically the Examiner believes that Applicant's claimed block having predominantly syndiotactic methyl methacrylate at a level greater than 60% syndiotactic is not enabled. Applicant disagrees. One of skill in the art would know how to manipulate the reaction conditions to control the level of syndiotacticity in the polymer block to form a block polymer with one block having 60% or more syndiotactic MMA.

For Example, US 5,656,704 describes a process for producing PMMA having syndiotactic triads of at least 70%. In the background section of the patent, it is stated that it is well known to prepare polymethylmethacrylate by a free radical technique with a syndiotactic content of 60 to 65%. The Background section also references a 1993 Polymer Preprints article describing a synthesis process that can produce PMMA with up to 67% syndiotacticity.

The above patent information is being given to support Applicant's contention that processes for producing a PMMA having at least 60% syndiotacticity were well established in the art at the time of Applicant's invention. This support information requires no new search by the Examiner, but merely supports Applicant's previously stated contention. The US 5,656,704 patent to produce a PMMA with over 70% syndiotacticity merely takes the level higher – but is not in itself needed to practice Applicant's invention – but merely used from its background information to show the knowledge of one of ordinary skill in the art. While the art cited shows that it is known how to produce a polymer having MMA units that are at least 60% syndiotactic, the cited art does not teach or suggest Applicants thermoplastic impact-reinforced polyamide in

which the polyamide is modified with 1-40 wt% of a block copolymer in which at least one block is made of PMMA having at least 60% syndiotacticity.

B. Claims 5, 6, and 10 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Specifically,

- a) The plural “methyl methacrylates” is unclear. Claim 5 has been amended to cite the singular “methacrylate”.
- b) Claim 10 cites “polyamides”, though claim 1 from which it depends already cites polyamide. The Examiner is correct that the term “polyamide” appears in both claims 1 and 10. However, Claim 1 recites a “polyamide composition” – which is a composition having both a polyamide, at least one block copolymer, and optionally at least one impact modifier. Claim 10 is to a polymer alloy which comprises both the “polyamide composition” of claim 1, plus a polyamide or polyolefin. The “polyamide” at the end of the claim is not the same as the “polyamide composition” at the beginning of the claim. Applicant therefore contends that Claim 10 is definite and does particularly point out and distinctly claim the subject matter that Applicant regards as the invention.

Whether the individual “polyamide” of claims 1 and claim 10 could be the same Or different – but that is irrelevant for a clear understanding of claim 10. Claim 10 claims an alloy of the polyamide composition of claim 1 (a polyamide + block copolymer + optional impact modifier) plus a polyamide (this polyamide is a polyamide – NOT a polyamide composition) or polyolefin.

#### Summary of the Invention:

Applicant has conducted research to find a polyamide-based thermoplastic composition, impact reinforced by a simple and inexpensive means, easy to implement, and not requiring the addition of a compatibilizing agent. Applicant has found that certain block copolymers, although immiscible with polyamides, can effectively reinforce them. Specifically blends based on a polyamide and on a block copolymer having at least one functionalized or nonfunctionalized PMMA block, syndiotactic to a level of greater than 60%, and at least one block with an

elastomeric nature exhibit excellent thermomechanical properties although the constituents of the blends are completely immiscible. These compositions exhibit excellent mechanical behavior at low temperature and at high temperature and introduce an effective solution to the problem set out above. (Page 3, [0010] and [0011] of the Substitute Specification)

### 35 U.S.C. §103(a)

#### Ruzette et al.

Claims 1, 2, 5, 6, 7-11, 15 and 16 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Ruzette et al. (US 2006/0063891). The Ruzette reference describes a brittle matrix that could be a polyamide [0007] modified with a block copolymer AB in which A is polymethylmethacrylate and B is a polyacrylate.

Applicant has amended claim 1 so that Applicant's elastomeric block B is composed of alkene units. The polyacrylate elastomer of the Ruzette reference does not teach or suggest Applicant's B block of alkene monomer units.

Further, the Ruzette reference is silent on the tacticity of the PMMA block. While methods are known in the art to increase the level of syndiotacticity in PMMA to above 60%, as required by Applicant's claims, PMMA is typically produced at a lower level of tacticity. The level of tacticity could not be optimized by routine experimentation based on the Ruzette reference, since tacticity was not recognized in the reference as being result-effective. MPEP 2144.05 says that only result-effective variables can be optimized. Paragraph [0011] of Applicant's Specification states that Applicant unexpectedly found that blends of a polyamide and a block copolymer having a PMMA block with greater than 60% syndiotacticity exhibited excellent thermomechanical properties – even though the constituents of the blends are completely immiscible. Such properties from an immiscible blend are not expected, based on the prior art.

Since the Ruzette reference fails to teach or suggest Applicant's claim limitations, as amended, there is no *prima facie* case of obviousness presented.

#### Kakeda et al.

Claims 1-11, 15 and 16 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kakeda et al. (WO 200292696) (US 2004/0147674). The WO '96 reference fails to teach

or suggest all of Applicant's claim limitations, and thus fails to present a *prima facie* case of obviousness. Specifically, the Kakeda reference fails to teach or suggest a block copolymer having either an alkene elastomeric phase or a PMMA block having methyl methacrylate monomer units that are at least 60 percent syndiotactic.

Applicant has amended claim 1 so that Applicant's elastomeric block B is composed of alkene units. The polyacrylate elastomer of the Kakeda reference does not teach or suggest Applicant's B block of alkene monomer units.

Further, the Kakeda reference is silent on the tacticity of the PMMA block. While methods are known in the art to increase the level of syndiotacticity in PMMA to above 60%, as required by Applicant's claims, PMMA is typically produced at a lower level of tacticity. The level of tacticity could not be optimized by routine experimentation based on the Kakeda reference, since tacticity was not recognized in the reference as being result-effective. MPEP 2144.05 says that only result-effective variables can be optimized. Paragraph [0011] of Applicant's Specification states that Applicant unexpectedly found that blends of a polyamide and a block copolymer having a PMMA block with greater than 60% syndiotacticity exhibited excellent thermomechanical properties – even though the constituents of the blends are completely immiscible. Such properties from an immiscible blend are not expected, based on the prior art.

Since the Kakeda reference fails to teach or suggest Applicant's claim limitations, as amended, there is no *prima facie* case of obviousness presented.

#### Tsuji et al.

Claims 1-11, 15 and 16 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Tsuji et al. (WO 200281561) (US 2004/0106732). The '891 reference fails to teach or suggest all of Applicant's claim limitations, and thus fails to present a *prima facie* case of obviousness. Specifically, the Tsuji reference fails to teach or suggest a block copolymer having methyl methacrylate monomer units, wherein said methyl methacrylate units are at least 60 percent syndiotactic nor an elastomeric block that is an alkene.

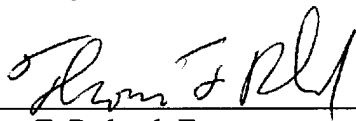
The Tsuji reference describes a method for producing a block copolymer having a methacrylic polymer block and an acrylic polymer block. Applicant has amended claim 1 so that Applicant's elastomeric block B is composed of alkene units. The polyacrylate elastomer of the

Tsuji reference does not teach or suggest Applicant's B block of alkene monomer units. The methacrylic polymer block is described in [0083]. There no mention of tacticity. Since the tacticity and its relationship to compatibility with polyamide are not recognized as result-effective, they cannot be optimized by routine experimentation. Since the Tsuji reference fails to teach or suggest Applicant's claim limitations, as amended, there is no *prima facie* case of obviousness presented.

Moreover, polyamides are mentioned only as one component of a large list of thermoplastics, of which no polyamide is used in the over 60 examples. There is no teaching or suggestion in the Tsuji reference to motivate one in the art to practice an impact modified polyamide having a block copolymer in having methyl methacrylate monomer units, wherein said methyl methacrylate units are at least 60 percent syndiotactic.

In view of the above, the Applicant believes that the reasons for rejection have been overcome, and the claims herein should be allowable to the Applicant. Accordingly, reconsideration and allowance are requested.

Respectfully submitted;

  
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